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MEASURING DISPENSER

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EP 335505
US 5392966

(57) Claim

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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Invention Title:	Measuring Dispenser

The following statement is a full description of this invention, including the best method of performing it known to us:

The present invention relates to a measuring dispenser for use with a liquid filled container.

Various measuring devices are known in the art whereby medicament or other fluid is displaced from a container into a measuring vessel. NZ314857 describes a dispensing device which has a rotatable attachment extending from the top of the dispenser which when rotated defines the volume of fluid to be dispensed. NZ235199 describes a fluid dispensing device which by rotatable adjustment of the cap, the volume of fluid dispensed can be controlled.

Such prior art devices however will be limited by lack of accuracy due to the subjectiveness of when the dispenser is filled to the appropriate level. Further since the dispenser and the thread which attaches to the bottle are usually integral it is often difficult to align the dispenser in a preferred orientation. This also prevents any manufacturing modularity, especially where there are a range of products designed for different sized containers and therefore different diameter openings.

It is an object of the present invention to overcome the abovementioned disadvantages or which will at least give the public a useful choice.

Accordingly the invention consists in an apparatus for dispensing a measured portion of liquid from a container with an opening comprising:

a measuring chamber including an inlet connected to said opening of said container;

cap means including a dispensing outlet, rotatably attached to said measuring chamber;

engagement means attached to the underside of said cap means;

fill level means rotatably attached to said engagement means such that a rotation of said cap means will result in an axial displacement of said fill level means;

wherein in use said measuring chamber is filled with said liquid from said container, followed by a volume of said liquid equal to said measured portion being restrained from flowing back into said container by said fill level means, whereby said measured portion is free to be dispensed from said dispensing outlet.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

One preferred form of the present invention will now be described with reference to the accompanying drawings in which;

Figure 1 is a perspective view of the present invention in its preferred form,

Figure 2 is a cross section of the present invention,

Figure 3 is a perspective view showing the top and engagement member in isolation;

Figure 4 is a perspective view of the dose indicator,

Figure 5 is a plan view of the dose indicator, and

Figure 6 is a cross section of the dose indicator

The present invention provides an easy to use measuring dispenser which is primarily designed for use for delivering medicament to animals. It has the advantages of simplicity of design which allow it to be easily produced and to have high reliability.

In the preferred embodiment the measuring dispenser is designed to be attached to a container of liquid as shown in Figure 1. The liquid may be medicament although it will be appreciated that general application in the dispensing of liquid would also be readily applicable. The dispenser is comprised of a dispensing cup 1, a rotatable cap 2 and a pouring spout 3. It will be appreciated that by rotating the cap an indicator 4 within the transparent dispensing cup 1 can be aligned with the desired level of liquid to be dispensed from the measured graduations 5 on the exterior. Once the indicator 4 is in the correct position the container 6 is then compressed resulting in the liquid contained therein filling the dispensing cup 1. Once the dispensing cup 1 is adequately filled the container 6 is then returned to its normal uncompressed state and any excess liquid in the dispensing cup 1 will drain back leaving only the desired amount remaining in the dispensing cup 1. The

final step is to then pour the measured quantity of liquid through the spout 3 by tilting the container 6 as would be normally appropriate.

In cross section, seen in Figure 2, the interaction of the various members will be apparent. The cap 2 is freely rotatable around the lip 10 of the dispensing cup 1 and is removably attached by the engagement of an annular skirt 11 and the lip 10 of the dispensing cup 1. A shaft 12 projects vertically downwards from the centre of the cap 2. It is seen in Figure 2, and in more detail in Figure 3, that the shaft 12 has a number of helical grooves 13 along it length. There are also two larger axial grooves 40 on opposing sides of the shaft 12, running the entire length.

The indicator 4 is displayed on the periphery of a slightly concaved dish 14 contained inside the dispensing cup 1. The dish 14 is attached to the top of a hollow cylinder 15 which encompasses the shaft 12 as shown in Figures 4, 5 & 6. The interior wall 16 of the cylinder 15 has at least one helical ridge 17 designed to interact with the helical grooves 13 of the shaft 12. A notch 20 in the side of the dish 14 interlocks with a fin 22 running axially down the inside wall of the dispensing cup 1. It will be appreciated that by rotating the cap 2 and therefore the attached shaft 12, the cylinder 15 and therefore the dish 14 will experience vertical movement due to the reaction force between the ridge 17 and the grooves 13, and the inability to rotate due to the notch 20 and fin 22 arrangement.

When the container 6 is compressed the liquid contained therein will flow up the straw 18 (which extends to the bottom of the container) between the axial grooves 40 of the shaft 12 and the inner wall 16 of the cylinder 15 into the head chamber 19. The liquid then flows down the gap 37 between the periphery of the dish 14 and the inner wall of the dispensing cup 1 into the measuring chamber 21 which is bounded by the inner wall of the dispensing cup 1 the underside of the dish 14 and the outer wall of the cylinder 15. Once the measuring chamber 21 is full the container 6 is returned to its normal uncompressed state. Any liquid in excess of the volume of the measuring chamber 21 contained in the head chamber 19 will then return down the axial grooves 40 down the straw 18 back into the container 6.

Once the measuring chamber 21 is correctly filled the measured volume of liquid is then free to be poured from the spout 3. The air hole 30 is provided to ensure that pouring occurs freely without "glugging". When inverted to pour the contents out, since the straw 19 extends to the bottom of the container no further liquid may flow from the container 6.

The dispensing cup 1 is effectively freely rotatably due its the snap lock attachment 32 to the threaded nut assembly 33 which itself is firmly tightened to the matching thread on the bottle opening 34. It will be appreciated that this allows both the calibrated graduations 5 and the pouring spout 3 to be easily rotated to a desired orientation. It will also be appreciated that there will exist a plastic to plastic seal between the cylinder 15 and the lower neck 36 of the dispensing cup 1 and also between the lower neck 36 of the dispensing cup and the threaded nut assembly 33. To ensure integrity of this seal a slight bulge 35 on the exterior of and at the lower end of the cylinder 15 is provided, which permits a constant and even force on the inner wall of the lower neck 36 of the dispensing cup 1. Similarly a slight bulge on the exterior of the lower neck 36 of the dispensing cup 1 is provided, which permits a constant and even force on the inner wall of the threaded nut assembly 33.

Furthermore it can be seen that with the dish 14 adjusted as far up as it will go, butting up against the breach 31 of the shaft 12, the dispenser will effectively be closed. In this state liquid cannot pass from the axial grooves 14 into the head chamber 19 and the container is sealed. This is indicated to the user by the dish matching up with the "off" marking on the exterior. Thus from the description it will be apparent that the vertical position of the dish 14 determines the volume of the measuring chamber and therefore that of the liquid dispensed. When at either extreme eg: fully off or on maximum volume, the cap can be over rotated, whereupon continued rotation results in a clicking sound. This is done to the helical ridge 17 being much smaller than the helical groove 13, and therefore is able to slip in and out at the extreme ends of the helical groove 13 without damage.

CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An Apparatus for dispensing a measured portion of liquid from a container with an opening comprising:

a measuring chamber including an inlet connected to said opening of said container;

cap means including a dispensing outlet, rotatably attached to said measuring chamber;

engagement means attached to the underside of said cap means;

fill level means adapted to be rotatably attached to said engagement means such that a rotation of said cap means will result in an axial displacement of said fill level means;

wherein in use said measuring chamber is adapted to be filled with liquid from said container, followed by a volume of said liquid equal to said measured portion being restrained from flowing back into said container by said fill level means, whereby said measured portion is free to be dispensed from said dispensing outlet.

2. An Apparatus as claimed in claim 1 wherein said fill level means comprises a first cylindrical member co-axial with said engagement means and an annular flange attached at what is in use the upper end of said cylindrical member.

3. An Apparatus as claimed in claim 2 wherein said engagement means comprises a second cylindrical member extending down from the underside of said cap means, with an axial groove along its length.

4. An Apparatus as claimed in claim 3 wherein and said fill level means includes at least one helical ridge on the inner wall of said first cylindrical member and said engagement means includes at least one helical groove on the outer wall of said second cylindrical member, and said rotatable attachment of fill level means to said engagement

means consists in the interaction of said helical ridge and said helical groove.

5. An Apparatus as claimed in any one of claims 1 to 4 further comprising an axial fin attached to the inner wall of said measuring chamber, and said fill level means including a notch in said annular flange which cooperates with said axial fin adapted to prevent said fill level means from rotating in use.

6. An Apparatus as claimed in any one of claims 1 to 5 wherein said annular flange includes an aperture substantially at the periphery of said annular flange, said annular flange being substantially conical, wherein when said apparatus is in an upright position any liquid excess to said measured portion flows from said aperture, down the upper face of said flange, down the inside of said first cylindrical member and through said opening into said container.

7. An Apparatus as claimed in any one of claims 1 to 6 further comprising an equalising aperture means provided in said cap means adapted to allow gases from outside said container into said measuring chamber when in use said measured portion is dispensed from said dispensing outlet.

8. An Apparatus for dispensing a measured portion of liquid from a container substantially as herein described with reference to and as illustrated by the accompanying drawings.

ABSTRACT

A measuring dispenser is disclosed which is designed to attach to the top of a squeeze bottle (6). The cap (2) is twisted to select the appropriate volume to be dispensed.

The bottle (6) is squeezed to fill the dispenser chamber (1) up. Then the bottle (6) is inverted to pour the contents from the chamber (1).

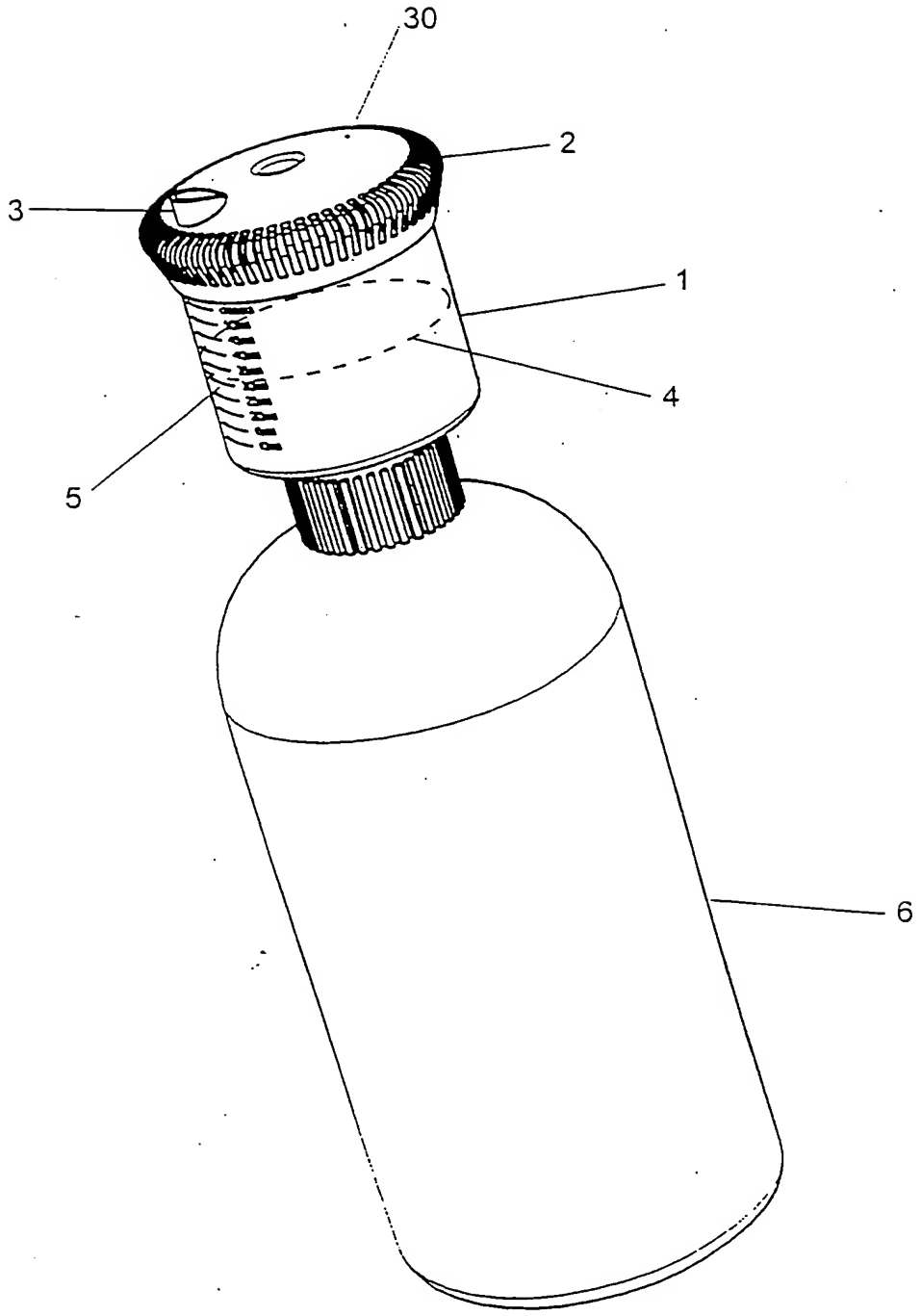

FIGURE 1

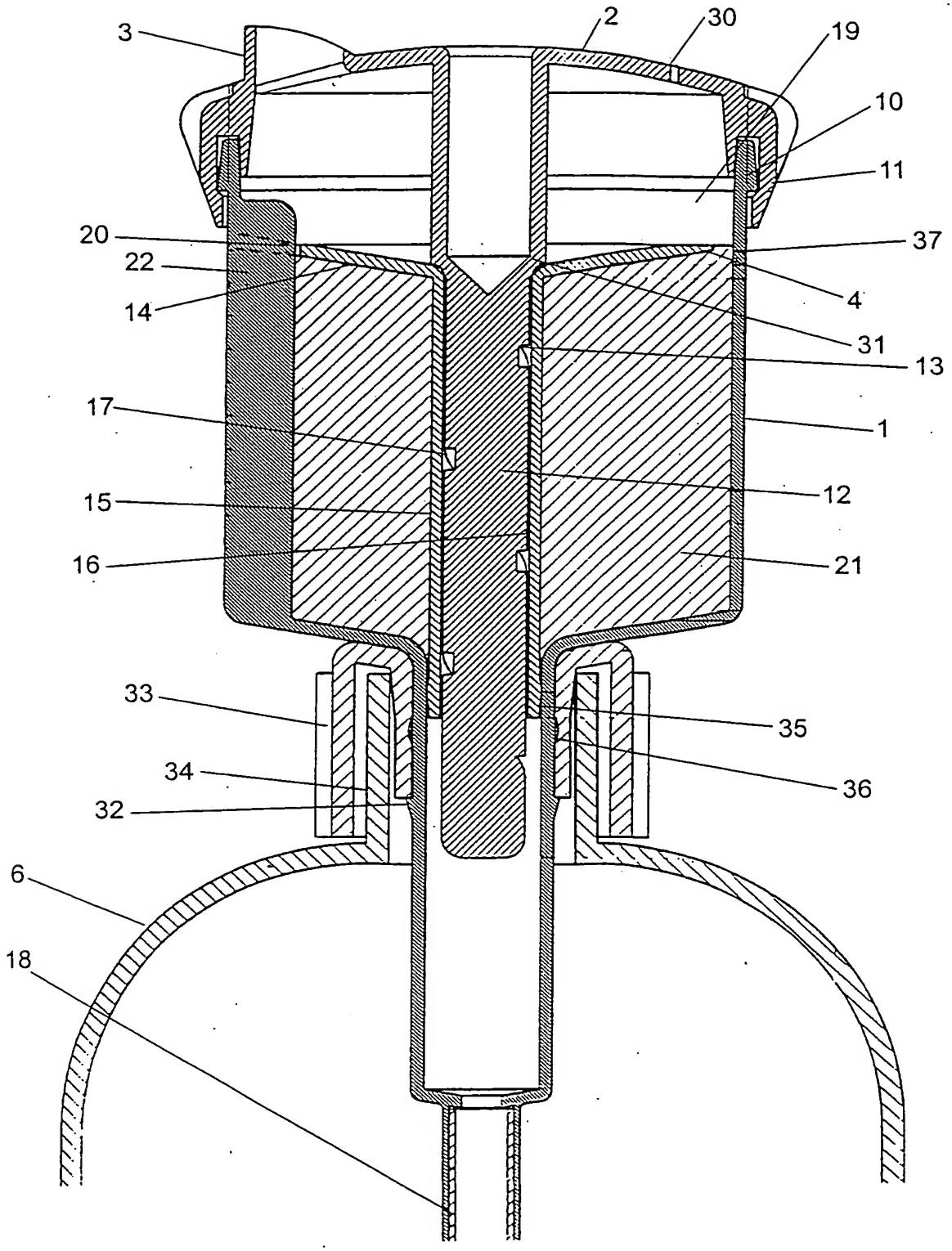

FIGURE 2

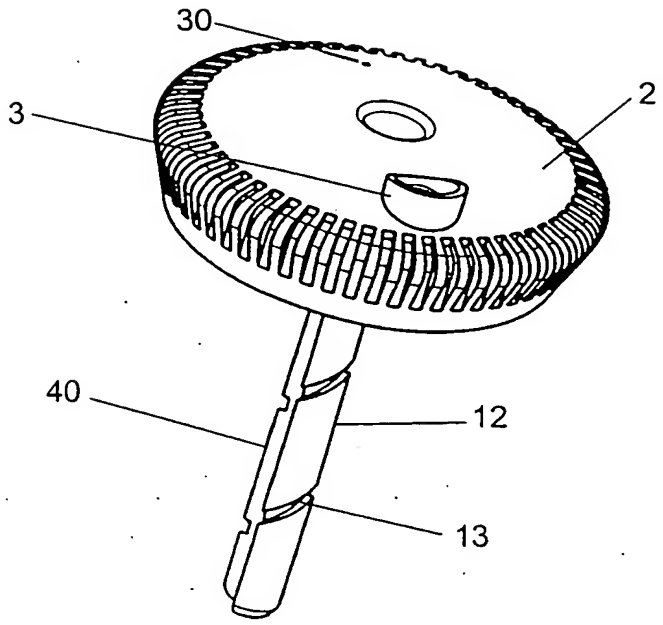

FIGURE 3

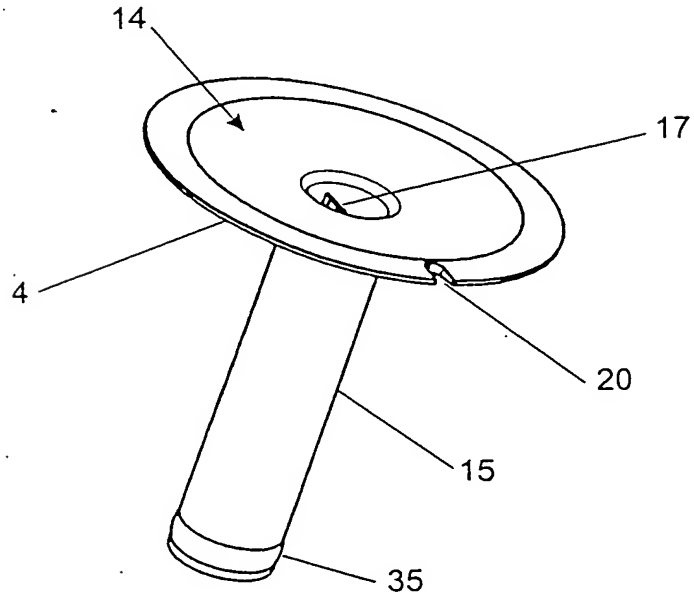

FIGURE 4

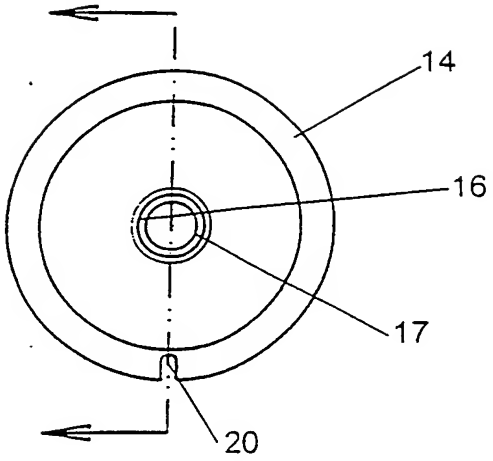

FIGURE 5

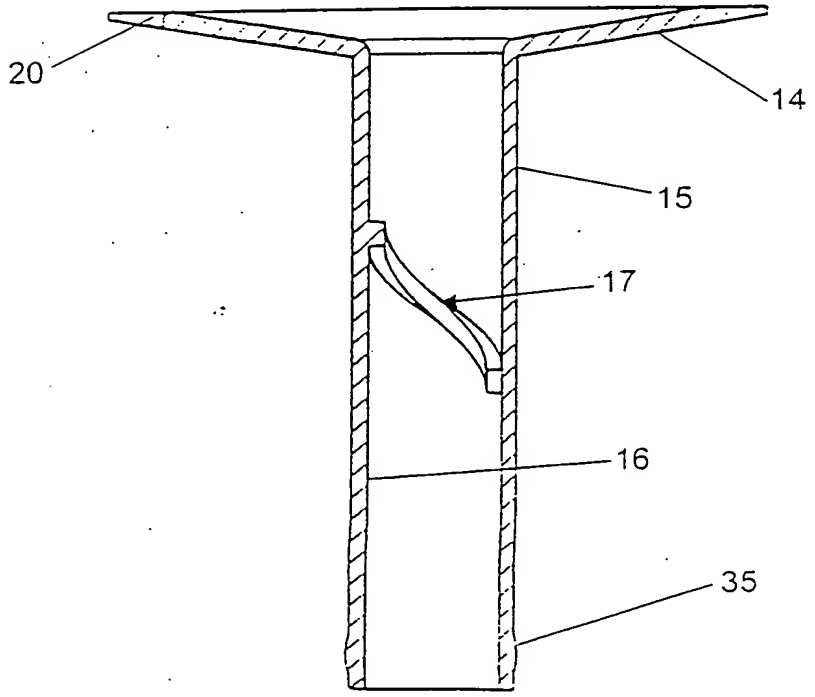

FIGURE 6